

Appendix 7E

Overland Flow and Surface Water Scoring

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SURFACE WATER SCORING AND RANKING

Introduction

There are a large number of river and stream crossings along the Longhorn pipeline. These include five major river crossings as well as crossings of secondary or above streams (at least one branch above the crossing), and crossings of primary streams (no branches above the crossing). In addition, there are a large number of low spots in the line, which depending on slope and soil characteristics, represent points where overland flow of gasoline or oil will move perpendicular to the line.

There are a number of potential impacts from a leak at a river or stream crossing. These may include:

- Downstream transport of gasoline or crude oil, and gasoline or crude oil constituents such as benzene, toluene, xylene, and in the case of gasoline MTBE;
- Contamination of the river bed soils; and
- Contamination of downstream aquifers which are regenerated from in-stream recharge features or through alluvium.

DATA SOURCES

The following information was collected on each surface water body crossed by the Longhorn Pipeline System:

- River/stream name at each crossing;
- Calculation of basin area draining to river/stream above each crossing point;
- Slope of river/stream in vicinity of crossing point;
- Longest distance from crossing to origination of watercourse;
- Slope of basin from selected origination point to crossing point;
- Flow data for specific rivers and creeks (where available);
- Modeling parameters for two crossings (Onion Creek, Colorado River);
- Downstream water rights for each secondary or above river or stream; and

- Maximum leak volume(s) for each point in pipeline.

Much of this information was collected from the United States Geological Society (USGS) maps or similar data sources. For example, calculation of the basin area was performed by manually delineating the basin for each river or stream. Other data were drawn from outside data sources, such as flow data and downstream water rights. Finally, leak volumes were calculated by GIS from pipeline diameter, proximity to valves, and topography along line.

In addition, for each 100 meters along the System, from Houston to El Paso, an overland flow trace was calculated using Digital Line Graph (DLG) surface models from USGS. For each 100 meters, it was possible to digitally construct an overland flow trace which would show the pathway of a theoretical volume of spilled gasoline or crude oil away from the line to the most likely surface water body.

Once this overland flow trace was modeled, the likelihood for a spill to reach the surface water body could be ranked. The following information was generated for each overland flow trace:

- The distance from the theoretical release point along the System to the nearest surface water body;
- The slope from the theoretical release point to the nearest surface water body; and
- The land use cover between the release point and the nearest surface water body.

Distance, slope, and cover will all effect the ability of a release to travel overland to a surface water body where it would be transported by water in the stream.

OBJECTIVES

Because of the System's large number of crossings, and even larger number of points along the pipeline with potential to impact surface waters due to overland flow from the pipeline to a stream, it was necessary to handle the surface water impacts as one large data set, that included both crossings and overland flow points. By combining these data sets, it was possible to rank each of the 2,516 segment of the line for potential to impact surface waters.

METHODOLOGY

The methodology for evaluating surface hydrology involved two separate phases; evaluation of leaks to rivers and streams, and evaluation of leaks to overland flow points.

Leaks to Rivers and Streams

The critical output from the evaluation of rivers and streams was to determine how far a certain concentration of select constituents might travel along the watercourse under different leak and flow scenarios. Scores were assigned to each stream crossed by the pipeline, based on ability of the stream to transport a spill (on a scale of 1 – 6), potential for isolation of a spill for cleanup (on a scale of 1 – 6), and combined value of downstream uses of the water, and distance to identified downstream use (on a scale of 1 – 10).

The transport and isolation scores are described in Chapter 4 of the Longhorn EA. Assignment of value/distance scores are described in Chapter 5 of the Longhorn EA. Downstream uses that were identified included public drinking water rights, in-stream recreation, and recreational uses in parks, state natural areas, and preserves.

Modeling was performed on one stream crossing, and one river crossing, at a range of hydrological conditions and leak scenarios. The models indicated that under certain flow conditions, travel of gasoline plumes containing benzene or MTBE at concentrations in excess of drinking water standards, could travel far downstream, although volatilization will decrease the concentrations of these constituents, particularly the volatile organic benzene. However, within streams or rivers, the plumes containing benzene/MTBE concentrations will pass by any point in the stream within about a 1-day time period. On the other hand, plumes of contamination reaching a lake, particularly plumes containing high concentrations of the less-volatile, highly soluble, in-water MTBE, may render the water in the lake non-potable for a more substantial period of time.

The overall sensitivity of a stream or river was calculated by summing the three scores described above – transport characteristics, ability to isolate, and distance/value of downstream water uses. The maximum combined score was 22, the minimum 3. Sensitivity and hypersensitivity for each stream and river crossed by the pipeline was then determined based on these factors.

Overland Flows

Three factors were used to determine the overland flows and intermittent streams during non-flow conditions of gasoline or crude oil. First is the slope of the land, which will determine how much impetus there is for the spill to move. Second is the distance to a surface water body. Third is the porosity of the soil, which will determine how quickly the spill is absorbed by the soils, retarding overland flows. For this exercise, soil porosity was evaluated as a function of land use cover.

Based on these three parameters, a score between 1 and 5 was assigned to each flow trace modeled. A score of 5 represented those flow traces most likely to reach surface water, including segments of the line actually including surface water crossings.

In order to rank these overland flow segments along with the surface water crossings along the System, the 1 – 5 overland flow score was translated into a 0.2 to 1.0 flow factor. This factor was then multiplied by the score for the surface water body that would be affected if a release reached a stream. Thus, a combined score of 22 represented a release at a point ranked as highly likely to result in contamination of a very sensitive surface water body.

SCORING RESULTS

Determination of Sensitive/Hypersensitive

Once a sensitivity/risk factor was calculated for each segment of the pipeline, a distribution curve was set up to evaluate sensitivity scores with miles of pipeline. The sensitivity score for each segment was plotted against the miles of pipeline having a lower sensitivity score than any given segment. The resulting curve showed a deflection point below which small decreases in sensitivity corresponded to large increases in the mileage. At this deflection point, sensitivity was assigned. The sensitivity point determination was then adjusted downward, as needed to include those crossings considered to possess sufficient value to be scored sensitive.

Sensitivity for drinking water impacts for overland flow segments was set at a score of 15.2. Drinking water hypersensitivity was assigned to overland flow segments having a score of 18 or higher.

Sensitivity for recreational impacts for overland flow segments set at a score of 15. No overland flow segments were rated as hypersensitive for recreational areas.

Segments Scored as Sensitive/Hypersensitive

The following number of segments and distances represent the areas rated as sensitive for drinking water or recreational water use, including segments including crossings:

- Drinking water sensitive – 93 segments, 15.19 miles;
- Recreational sensitive - 73 segments, 11.49 miles;
- Drinking water hypersensitive – 6.18 miles; and
- Recreational hypersensitive – 7.51 miles.

The segments scored as sensitive or hypersensitive as well as scorings, are included in Tables 7E-1 through 7E-4.

CONCLUSIONS

The results of the impact analysis focused on potential damages to in-stream uses and to water rights for rivers and streams. After concentrations of concern were defined, modeling results are extrapolated to the entire population of 2nd degree above rivers and streams, and downstream concentrations are projected. The types of water rights and in-stream water uses that are impacted downstream will be catalogued.

The secondary impact of potential downstream contamination of ground water resources (due to surface features or adsorption into the river alluvium) was also addressed quantitatively. It is not possible to do a complete and precise assessment of the amount of contamination possible for these aquifers. However, it will be possible to identify which resources may be impacted, the conditions under which those impacts may take place (i.e., high flow in river versus low flow), and the mitigation measures be available for preventing those impacts.

Table 7E-5 identifies all of the segments, including approximately 19 miles, rated as sensitive either for drinking water or recreation. These are also included in Table 7E-1.

Table 7E-1. Drinking Water Sensitive Segments Along Longhorn Pipeline

| Begin Mile | End Mile | Stream Name | Stream Number | Stream Crossing Milepoint | Segment Length | Segment Overland Flow Code | Segment Drains to Stream Number: | Dw Sens | Rec Sens | DW Sens x Overland Flow | Rec Sens x Overland Flow |
|------------|----------|------------------|---------------|---------------------------|----------------|----------------------------|----------------------------------|---------|----------|-------------------------|--------------------------|
| 163.48 | 163.67 | Marble Creek | 101 | 163.50 | 0.19 | 5 | 101 | 16 | 18 | 16 | 18 |
| 163.67 | 163.86 | * | 102 | 163.56 | 0.19 | 5 | 101 | 16 | 18 | 16 | 18 |
| 163.92 | 164.04 | Onion Creek | 103 | 163.98 | 0.12 | 5 | 103 | 20 | 22 | 20 | 22 |
| 164.10 | 164.17 | | | | 0.06 | 4 | 103 | 20 | 22 | 16 | 17.6 |
| 164.91 | 164.97 | | | | 0.06 | 4 | 103 | 20 | 22 | 16 | 17.6 |
| 179.51 | 179.89 | Long Branch | 108 | 179.63 | 0.37 | 5 | 108 | 16 | 18 | 16 | 18 |
| 180.20 | 180.26 | | | | 0.06 | 5 | 108 | 16 | 18 | 16 | 18 |
| 180.88 | 181.01 | Barton Creek | 109 | 180.92 | 0.12 | 5 | 109 | 18 | 20 | 18 | 20 |
| 182.12 | 182.19 | | | | 0.06 | 5 | 109 | 18 | 20 | 18 | 20 |
| 182.43 | 182.50 | | | | 0.06 | 5 | 109 | 18 | 20 | 18 | 20 |
| 184.73 | 184.86 | | | | 0.12 | 5 | 110 | 18 | 14 | 18 | 14 |
| 185.42 | 185.79 | Fitzhugh Creek | 110 | 185.76 | 0.37 | 5 | 110 | 18 | 14 | 18 | 14 |
| 185.79 | 185.85 | | | | 0.06 | 5 | 110 | 18 | 14 | 18 | 14 |
| 187.53 | 187.65 | | | | 0.12 | 5 | 110 | 18 | 14 | 18 | 14 |
| 189.46 | 189.58 | | | | 0.12 | 5 | 111 | 16 | 16 | 16 | 16 |
| 190.08 | 190.20 | | | | 0.12 | 5 | 111 | 16 | 16 | 16 | 16 |
| 190.26 | 190.39 | Unk 111 | 111 | 190.34 | 0.12 | 5 | 111 | 16 | 16 | 16 | 16 |
| 191.38 | 191.44 | | | | 0.06 | 5 | 111 | 16 | 16 | 16 | 16 |
| 192.19 | 192.25 | | | | 0.06 | 4 | 112 | 19 | 19 | 15.2 | 15.2 |
| 192.63 | 192.94 | | | | 0.31 | 4 | 112 | 19 | 19 | 15.2 | 15.2 |
| 192.94 | 193.00 | | | | 0.06 | 5 | 112 | 19 | 19 | 19 | 19 |
| 193.00 | 193.25 | Flat Creek | 112 | 193.21 | 0.25 | 5 | 112 | 19 | 19 | 19 | 13 |
| 193.25 | 193.31 | | | | 0.06 | 5 | 112 | 19 | 19 | 19 | 19 |
| 193.31 | 193.43 | | | | 0.12 | 4 | 112 | 19 | 19 | 15.2 | 15.2 |
| 193.68 | 194.18 | | | | 0.50 | 4 | 112 | 19 | 19 | 15.2 | 15.2 |
| 196.10 | 196.29 | Unk 113 | 113 | 196.15 | 0.19 | 5 | 113 | 17 | 17 | 17 | 17 |
| 197.29 | 197.53 | | | | 0.25 | 5 | 114 | 17 | 17 | 17 | 17 |
| 198.16 | 198.28 | Unk 114 | 114 | 198.23 | 0.12 | 5 | 114 | 17 | 17 | 17 | 17 |
| 198.59 | 198.78 | Pedernales River | 115 | 198.73 | 0.19 | 5 | 115 | 22 | 22 | 22 | 22 |
| 198.78 | 198.84 | Unk 116 | 116 | 198.80 | 0.06 | 5 | 115 | 22 | 22 | 22 | 22 |
| 198.84 | 198.96 | | | | 0.12 | 4 | 115 | 22 | 22 | 17.6 | 17.6 |
| 199.34 | 199.46 | Unk 117 | 117 | 199.37 | 0.12 | 5 | 117 | 17 | 17 | 17 | 17 |
| 201.26 | 201.39 | | | | 0.12 | 5 | 118 | 17 | 17 | 17 | 17 |
| 201.88 | 202.13 | Unk 118 | 118 | 201.94 | 0.25 | 5 | 118 | 17 | 17 | 17 | 17 |
| 202.26 | 202.57 | Cottonwood Creek | 119 | 202.49 | 0.31 | 5 | 119 | 18 | 18 | 18 | 18 |
| 202.57 | 202.63 | | | | 0.06 | 5 | 119 | 18 | 18 | 18 | 18 |
| 203.13 | 203.31 | Cottonwood Creek | 120 | 203.19 | 0.19 | 5 | 120 | 17 | 17 | 17 | 17 |
| 203.31 | 203.44 | Cottonwood Creek | 121 | 203.37 | 0.12 | 5 | 121 | 17 | 17 | 17 | 17 |
| 204.93 | 205.05 | Unk 122 | 122 | 205.02 | 0.12 | 5 | 122 | 17 | 17 | 17 | 17 |
| 205.05 | 205.18 | | | | 0.12 | 5 | 122 | 17 | 17 | 17 | 17 |
| 205.98 | 206.05 | Harden Russell | 123 | 206.03 | 0.06 | 5 | 123 | 16 | 16 | 16 | 16 |
| 206.23 | 206.36 | | | | 0.12 | 5 | 123 | 16 | 16 | 16 | 16 |
| 207.91 | 208.04 | Buffalo Creek | 124 | 207.98 | 0.12 | 5 | 124 | 17 | 17 | 17 | 17 |
| 209.22 | 209.34 | | | | 0.12 | 5 | 125 | 16 | 16 | 16 | 16 |
| 209.84 | 209.96 | Hickory Creek | 125 | 209.91 | 0.12 | 5 | 125 | 16 | 16 | 16 | 16 |
| 211.45 | 211.64 | Spring Branch | 126 | 211.61 | 0.19 | 5 | 126 | 15 | 15 | 15 | 15 |
| 212.82 | 212.88 | | | | 0.06 | 5 | 127 | 16 | 16 | 16 | 16 |
| 213.19 | 213.25 | | | | 0.06 | 5 | 127 | 16 | 16 | 16 | 16 |
| 213.25 | 213.44 | White Oak Creek | 127 | 213.26 | 0.19 | 5 | 127 | 16 | 16 | 16 | 16 |
| 228.66 | 229.29 | | | | 0.62 | 4 | 135 | 20 | 16 | 16 | 12.8 |
| 229.29 | 229.35 | Crabapple Creek | 135 | 229.33 | 0.06 | 5 | 135 | 20 | 16 | 20 | 16 |
| 229.35 | 229.66 | | | | 0.31 | 4 | 135 | 20 | 16 | 16 | 12.8 |
| 230.34 | 230.40 | | | | 0.06 | 5 | 136 | 17 | 13 | 17 | 13 |
| 230.72 | 230.90 | Unk 136 | 136 | 230.75 | 0.19 | 5 | 136 | 17 | 13 | 17 | 13 |
| 240.22 | 240.35 | Unk 141 | 141 | 240.31 | 0.12 | 5 | 141 | 17 | 11 | 17 | 11 |
| 247.74 | 247.93 | | | | 0.19 | 5 | 147 | 16 | 11 | 16 | 11 |
| 247.99 | 248.11 | Cedar Hollow | 147 | 248.01 | 0.12 | 5 | 147 | 16 | 11 | 16 | 11 |
| 248.11 | 248.30 | Cedar Hollow | 148 | 248.23 | 0.19 | 5 | 148 | 16 | 11 | 16 | 11 |

Table 7E-1. (Continued)

| Begin Mile | End Mile | Stream Name | Stream Number | Stream Crossing Milepoint | Segment Length | Segment Overland Flow Code | Segment Drains to Stream Number: | Dw Sens | Rec Sens | DW Sens x Overland Flow | Rec Sens x Overland Flow |
|-------------------|-----------------|--------------------|----------------------|----------------------------------|-----------------------|-----------------------------------|---|----------------|-----------------|--------------------------------|---------------------------------|
| 248.30 | 248.55 | Squaw Creek | 150 | 248.49 | 0.25 | 5 | 150 | 18 | 13 | 18 | 13 |
| 248.80 | 248.86 | | | | 0.06 | 5 | 150 | 18 | 13 | 18 | 13 |
| 248.98 | 249.11 | Threadgill Creek | 151 | 249.99 | 0.12 | 5 | 150 | 18 | 13 | 18 | 13 |
| 249.73 | 250.10 | Spring Branch | 152 | 250.04 | 0.37 | 5 | 151 | 18 | 13 | 18 | 13 |
| 250.10 | 250.16 | | | | 0.06 | 5 | 152 | 15 | 10 | 15 | 10 |
| 250.16 | 250.29 | Spring Branch | 153 | 250.24 | 0.12 | 5 | 153 | 15 | 10 | 15 | 10 |
| 250.29 | 250.47 | Spring Branch | 154 | 250.34 | 0.19 | 5 | 154 | 15 | 10 | 15 | 10 |
| 254.82 | 255.07 | Panther Creek | 156 | 254.87 | 0.25 | 5 | 156 | 15 | 11 | 15 | 11 |
| 255.51 | 255.57 | | | | 0.06 | 5 | 157 | 15 | 11 | 15 | 11 |
| 255.94 | 256.00 | Panther Creek | 157 | 255.98 | 0.06 | 5 | 157 | 15 | 11 | 15 | 11 |
| 257.81 | 258.06 | Rocky Creek | 158 | 257.89 | 0.25 | 5 | 158 | 15 | 11 | 15 | 11 |
| 259.92 | 260.11 | Schep Creek | 160 | 260.04 | 0.19 | 5 | 160 | 15 | 11 | 15 | 11 |
| 260.11 | 260.17 | | | | 0.06 | 5 | 160 | 15 | 11 | 15 | 11 |
| 262.09 | 262.16 | | | | 0.06 | 4 | 161 | 20 | 18 | 16 | 14.4 |
| 263.46 | 263.59 | | | | 0.12 | 4 | 161 | 20 | 18 | 16 | 14.4 |
| 263.65 | 263.96 | James River | 161 | 263.89 | 0.31 | 5 | 161 | 20 | 18 | 20 | 18 |
| 263.96 | 264.02 | | | | 0.06 | 5 | 161 | 20 | 18 | 20 | 18 |
| 264.02 | 264.08 | | | | 0.06 | 4 | 161 | 20 | 18 | 16 | 14.4 |
| 264.08 | 264.33 | | | | 0.25 | 5 | 161 | 20 | 18 | 20 | 18 |
| 264.33 | 264.89 | | | | 0.56 | 4 | 161 | 20 | 18 | 16 | 14.4 |
| 264.89 | 265.01 | | | | 0.12 | 5 | 162 | 15 | 11 | 15 | 11 |
| 265.82 | 266.13 | Mill Creek | 162 | 265.99 | 0.31 | 5 | 162 | 15 | 11 | 15 | 11 |
| 266.69 | 266.82 | Unk 163 | 163 | 266.71 | 0.12 | 5 | 163 | 15 | 11 | 15 | 11 |
| 267.00 | 267.19 | | | | 0.19 | 5 | 163 | 15 | 11 | 15 | 11 |
| 267.75 | 267.87 | Mill Creek | 164 | 267.86 | 0.12 | 5 | 164 | 16 | 12 | 16 | 12 |
| 267.87 | 267.94 | | | | 0.06 | 5 | 164 | 16 | 12 | 16 | 12 |
| 269.49 | 269.55 | | | | 0.06 | 5 | 164 | 16 | 12 | 16 | 12 |
| 271.23 | 271.41 | Little Rocky Creek | 165 | 271.30 | 0.19 | 5 | 165 | 15 | 11 | 15 | 11 |
| 271.66 | 271.79 | | | | 0.12 | 5 | 165 | 15 | 11 | 15 | 11 |
| 275.76 | 275.95 | Unk 167 | 167 | 275.83 | 0.19 | 5 | 167 | 15 | 11 | 15 | 11 |
| 276.37 | 276.77 | Llano River | 168 | 276.57 | 0.40 | 5 | 168 | 20 | 18 | 20 | 18 |
| 315.91 | 316.03 | | | | 0.12 | 5 | 185 | 15 | 11 | 15 | 11 |
| 324.05 | 324.42 | Middle Valley | 192 | 324.20 | 0.37 | 5 | 192 | 15 | 11 | 15 | 11 |
| 334.11 | 334.30 | Antelope Draw | 197 | 334.27 | 0.19 | 5 | 197 | 15 | 11 | 15 | 11 |
| 334.30 | 334.36 | | | | 0.06 | 5 | 197 | 15 | 11 | 15 | 11 |

Table 7E-2. Drinking Water Hypersensitive Segments Along Longhorn Pipeline

| Begin Mile | End Mile | Stream Name | Stream Number | Stream Crossing Milepoint | Segment length | Segment Overland Flow Code | Segment Drains to Stream Number: | DW Sens | Rec Sens | DW Sens x Overland Flow | Rec Sens x Overland Flow |
|------------|----------|------------------|---------------|---------------------------|----------------|----------------------------|----------------------------------|---------|----------|-------------------------|--------------------------|
| 163.48 | 163.67 | Marble Creek | 101 | 163.50 | 0.19 | 5 | 101 | 16 | 18 | 16 | 18 |
| 163.67 | 163.86 | * | 102 | 163.56 | 0.19 | 5 | 101 | 16 | 18 | 16 | 18 |
| 163.92 | 164.04 | Onion Creek | 103 | 163.98 | 0.12 | 5 | 103 | 20 | 22 | 20 | 22 |
| 179.51 | 179.89 | Long Branch | 108 | 179.63 | 0.37 | 5 | 108 | 16 | 18 | 16 | 18 |
| 180.88 | 181.01 | Barton Creek | 109 | 180.92 | 0.12 | 5 | 109 | 18 | 20 | 18 | 20 |
| 185.42 | 185.79 | Fitzhugh Creek | 110 | 185.76 | 0.37 | 5 | 110 | 18 | 14 | 18 | 14 |
| 190.26 | 190.39 | Unk 111 | 111 | 190.34 | 0.12 | 5 | 111 | 16 | 16 | 16 | 16 |
| 193.00 | 193.25 | Flat Creek | 112 | 193.21 | 0.25 | 5 | 112 | 19 | 19 | 19 | 13 |
| 196.10 | 196.29 | Unk 113 | 113 | 196.15 | 0.19 | 5 | 113 | 17 | 17 | 17 | 17 |
| 198.16 | 198.28 | Unk 114 | 114 | 198.23 | 0.12 | 5 | 114 | 17 | 17 | 17 | 17 |
| 198.59 | 198.78 | Pedernales River | 115 | 198.73 | 0.19 | 5 | 115 | 22 | 22 | 22 | 22 |
| 198.78 | 198.84 | Unk 116 | 116 | 198.80 | 0.06 | 5 | 115 | 22 | 22 | 22 | 22 |
| 199.34 | 199.46 | Unk 117 | 117 | 199.37 | 0.12 | 5 | 117 | 17 | 17 | 17 | 17 |
| 201.88 | 202.13 | Unk 118 | 118 | 201.94 | 0.25 | 5 | 118 | 17 | 17 | 17 | 17 |
| 202.26 | 202.57 | Cottonwood Creek | 119 | 202.49 | 0.31 | 5 | 119 | 18 | 18 | 18 | 18 |
| 203.13 | 203.31 | Cottonwood Creek | 120 | 203.19 | 0.19 | 5 | 120 | 17 | 17 | 17 | 17 |
| 203.31 | 203.44 | Cottonwood Creek | 121 | 203.37 | 0.12 | 5 | 121 | 17 | 17 | 17 | 17 |
| 204.93 | 205.05 | Unk 122 | 122 | 205.02 | 0.12 | 5 | 122 | 17 | 17 | 17 | 17 |
| 205.98 | 206.05 | Harden Russell | 123 | 206.03 | 0.06 | 5 | 123 | 16 | 16 | 16 | 16 |
| 207.91 | 208.04 | Buffalo Creek | 124 | 207.98 | 0.12 | 5 | 124 | 17 | 17 | 17 | 17 |
| 209.84 | 209.96 | Hickory Creek | 125 | 209.91 | 0.12 | 5 | 125 | 16 | 16 | 16 | 16 |
| 213.25 | 213.44 | White Oak Creek | 127 | 213.26 | 0.19 | 5 | 127 | 16 | 16 | 16 | 16 |
| 229.29 | 229.35 | Crabapple Creek | 135 | 229.33 | 0.06 | 5 | 135 | 20 | 16 | 20 | 16 |
| 230.72 | 230.90 | Unk 136 | 136 | 230.75 | 0.19 | 5 | 136 | 17 | 13 | 17 | 13 |
| 240.22 | 240.35 | Unk 141 | 141 | 240.31 | 0.12 | 5 | 141 | 17 | 11 | 17 | 11 |
| 247.99 | 248.11 | Cedar Hollow | 147 | 248.01 | 0.12 | 5 | 147 | 16 | 11 | 16 | 11 |
| 248.11 | 248.30 | Cedar Hollow | 148 | 248.23 | 0.19 | 5 | 148 | 16 | 11 | 16 | 11 |
| 248.30 | 248.55 | Squaw Creek | 150 | 248.49 | 0.25 | 5 | 150 | 18 | 13 | 18 | 13 |
| 248.98 | 249.11 | Threadgill Creek | 151 | 249.99 | 0.12 | 5 | 150 | 18 | 13 | 18 | 13 |
| 249.73 | 250.10 | Spring Branch | 152 | 250.04 | 0.37 | 5 | 151 | 18 | 13 | 18 | 13 |
| 263.65 | 263.96 | James River | 161 | 263.89 | 0.31 | 5 | 161 | 20 | 18 | 20 | 18 |
| 267.75 | 267.87 | Mill Creek | 164 | 267.86 | 0.12 | 5 | 164 | 16 | 12 | 16 | 12 |
| 276.37 | 276.77 | Llano River | 168 | 276.57 | 0.40 | 5 | 168 | 20 | 18 | 20 | 18 |

Table 7E-3. Recreational Waters Sensitive Segments Along Longhorn Pipeline

| Begin Mile | End Mile | Stream Name | Stream Number | Stream Crossing Milepoint | Segment length | Segment Overland Flow Code | Segment Drains to Stream Number: | DW Sens | Rec Sens | DW Sens x Overland Flow | Rec Sens x Overland Flow |
|------------|----------|---------------------------|---------------|---------------------------|----------------|----------------------------|----------------------------------|---------|----------|-------------------------|--------------------------|
| 63.81 | 64.00 | Clear Creek ³ | 44 | 63.91 | 0.19 | 5 | 45 | 13 | 16 | 13 | 16 |
| 64.00 | 64.06 | Brazos River | 45 | 64.00 | 0.06 | 5 | 45 | 13 | 16 | 13 | 16 |
| 127.88 | 128.00 | Hunt Creek | 83 | 127.92 | 0.12 | 5 | 83 | 8 | 17 | 8 | 17 |
| 131.30 | 131.54 | Alum Creek | 86 | 131.46 | 0.25 | 5 | 86 | 11 | 14 | 11 | 14 |
| 134.40 | 134.53 | Colorado River | 89 | 134.44 | 0.12 | 5 | 89 | 13 | 22 | 13 | 22 |
| 134.53 | 134.59 | * | 90 | 134.51 | 0.06 | 5 | 90 | 9 | 18 | 9 | 18 |
| 163.48 | 163.67 | Marble Creek | 101 | 163.50 | 0.19 | 5 | 101 | 16 | 18 | 16 | 18 |
| 163.67 | 163.86 | * | 102 | 163.56 | 0.19 | 5 | 101 | 16 | 18 | 16 | 18 |
| 163.92 | 164.04 | Onion Creek | 103 | 163.98 | 0.12 | 5 | 103 | 20 | 22 | 20 | 22 |
| 164.10 | 164.17 | | | | 0.06 | 4 | 103 | 20 | 22 | 16 | 17.6 |
| 164.91 | 164.97 | | | | 0.06 | 4 | 103 | 20 | 22 | 16 | 17.6 |
| 167.34 | 167.52 | | | | 0.19 | 5 | 104 | 14 | 16 | 14 | 16 |
| 168.08 | 168.27 | | | | 0.19 | 5 | 104 | 14 | 16 | 14 | 16 |
| 168.39 | 168.89 | Boggy Creek 104, 105, 106 | 104 | 168.55 | 0.50 | 5 | 106 | 10 | 16 | 10 | 16 |
| 168.89 | 168.95 | Boggy Creek | 105 | 168.79 | 0.06 | 5 | 106 | 10 | 16 | 10 | 16 |
| 168.95 | 169.26 | Boggy Creek | 106 | 168.82 | 0.31 | 5 | 106 | 10 | 16 | 10 | 16 |
| 174.61 | 174.67 | Slaughter Creek | 107 | 174.65 | 0.06 | 5 | 107 | 14 | 16 | 14 | 16 |
| 174.67 | 174.73 | | | | 0.06 | 5 | 107 | 14 | 16 | 14 | 16 |
| 179.51 | 179.89 | Long Branch | 108 | 179.63 | 0.37 | 5 | 108 | 16 | 18 | 16 | 18 |
| 180.20 | 180.26 | | | | 0.06 | 5 | 108 | 16 | 18 | 16 | 18 |
| 180.82 | 180.88 | | | | 0.06 | 4 | 109 | 18 | 20 | 14.4 | 16 |
| 180.88 | 181.01 | Barton Creek | 109 | 180.92 | 0.12 | 5 | 109 | 18 | 20 | 18 | 20 |
| 181.94 | 182.12 | | | | 0.19 | 4 | 109 | 18 | 20 | 14.4 | 16 |
| 182.12 | 182.19 | | | | 0.06 | 5 | 109 | 18 | 20 | 18 | 20 |
| 182.19 | 182.25 | | | | 0.06 | 4 | 109 | 18 | 20 | 14.4 | 16 |
| 182.37 | 182.43 | | | | 0.06 | 4 | 109 | 18 | 20 | 14.4 | 16 |
| 182.43 | 182.50 | | | | 0.06 | 5 | 109 | 18 | 20 | 18 | 20 |
| 182.62 | 182.68 | | | | 0.06 | 4 | 109 | 18 | 20 | 14.4 | 16 |
| 185.42 | 185.79 | Fitzhugh Creek | 110 | 185.76 | 0.37 | 5 | 110 | 18 | 14 | 18 | 14 |
| 189.46 | 189.58 | | | | 0.12 | 5 | 111 | 16 | 16 | 16 | 16 |
| 190.08 | 190.20 | | | | 0.12 | 5 | 111 | 16 | 16 | 16 | 16 |
| 190.26 | 190.39 | Unk 111 | 111 | 190.34 | 0.12 | 5 | 111 | 16 | 16 | 16 | 16 |
| 191.38 | 191.44 | | | | 0.06 | 5 | 111 | 16 | 16 | 16 | 16 |
| 192.19 | 192.25 | | | | 0.06 | 4 | 112 | 19 | 19 | 15.2 | 15.2 |
| 192.63 | 192.94 | | | | 0.31 | 4 | 112 | 19 | 19 | 15.2 | 15.2 |
| 192.94 | 193.00 | | | | 0.06 | 5 | 112 | 19 | 19 | 19 | 19 |
| 193.25 | 193.31 | | | | 0.06 | 5 | 112 | 19 | 19 | 19 | 19 |
| 193.31 | 193.43 | | | | 0.12 | 4 | 112 | 19 | 19 | 15.2 | 15.2 |
| 193.68 | 194.18 | | | | 0.50 | 4 | 112 | 19 | 19 | 15.2 | 15.2 |
| 196.10 | 196.29 | Unk 113 | 113 | 196.15 | 0.19 | 5 | 113 | 17 | 17 | 17 | 17 |
| 197.29 | 197.53 | | | | 0.25 | 5 | 114 | 17 | 17 | 17 | 17 |
| 198.16 | 198.28 | Unk 114 | 114 | 198.23 | 0.12 | 5 | 114 | 17 | 17 | 17 | 17 |
| 198.59 | 198.78 | Pedernales River | 115 | 198.73 | 0.19 | 5 | 115 | 22 | 22 | 22 | 22 |
| 198.78 | 198.84 | Unk 116 | 116 | 198.80 | 0.06 | 5 | 115 | 22 | 22 | 22 | 22 |
| 198.84 | 198.96 | | | | 0.12 | 4 | 115 | 22 | 22 | 17.6 | 17.6 |
| 199.34 | 199.46 | Unk 117 | 117 | 199.37 | 0.12 | 5 | 117 | 17 | 17 | 17 | 17 |
| 201.26 | 201.39 | | | | 0.12 | 5 | 118 | 17 | 17 | 17 | 17 |
| 201.88 | 202.13 | Unk 118 | 118 | 201.94 | 0.25 | 5 | 118 | 17 | 17 | 17 | 17 |
| 202.26 | 202.57 | Cottonwood Creek | 119 | 202.49 | 0.31 | 5 | 119 | 18 | 18 | 18 | 18 |
| 202.57 | 202.63 | | | | 0.06 | 5 | 119 | 18 | 18 | 18 | 18 |
| 203.13 | 203.31 | Cottonwood Creek | 120 | 203.19 | 0.19 | 5 | 120 | 17 | 17 | 17 | 17 |
| 203.31 | 203.44 | Cottonwood Creek | 121 | 203.37 | 0.12 | 5 | 121 | 17 | 17 | 17 | 17 |
| 204.93 | 205.05 | Unk 122 | 122 | 205.02 | 0.12 | 5 | 122 | 17 | 17 | 17 | 17 |
| 205.05 | 205.18 | | | | 0.12 | 5 | 122 | 17 | 17 | 17 | 17 |
| 205.98 | 206.05 | Harden Russell | 123 | 206.03 | 0.06 | 5 | 123 | 16 | 16 | 16 | 16 |
| 206.23 | 206.36 | | | | 0.12 | 5 | 123 | 16 | 16 | 16 | 16 |
| 207.91 | 208.04 | Buffalo Creek | 124 | 207.98 | 0.12 | 5 | 124 | 17 | 17 | 17 | 17 |

Table 7E-3. (Continued)

| Begin Mile | End Mile | Stream Name | Stream Number | Stream Crossing Milepoint | Segment length | Segment Overland Flow Code | Segment Drains to Stream Number: | DW Sens | Rec Sens | DW Sens x Overland Flow | Rec Sens x Overland Flow |
|-----------------------|---------------------|------------------------|--------------------------|--|---------------------------|---|---|--------------------|---------------------|--|---|
| 209.22 | 209.34 | | | | 0.12 | 5 | 125 | 16 | 16 | 16 | 16 |
| 209.84 | 209.96 | Hickory Creek | 125 | 209.91 | 0.12 | 5 | 125 | 16 | 16 | 16 | 16 |
| 211.45 | 211.64 | Spring Branch | 126 | 211.61 | 0.19 | 5 | 126 | 15 | 15 | 15 | 15 |
| 212.82 | 212.88 | | | | 0.06 | 5 | 127 | 16 | 16 | 16 | 16 |
| 213.19 | 213.25 | | | | 0.06 | 5 | 127 | 16 | 16 | 16 | 16 |
| 213.25 | 213.44 | White Oak Creek | 127 | 213.26 | 0.19 | 5 | 127 | 16 | 16 | 16 | 16 |
| 229.29 | 229.35 | Crabapple Creek | 135 | 229.33 | 0.06 | 5 | 135 | 20 | 16 | 20 | 16 |
| 233.08 | 233.32 | Unk 137 | 137 | 233.19 | 0.25 | 5 | 137 | 14 | 14 | 14 | 14 |
| 234.75 | 234.88 | Sandy Creek (1) | 138 | 234.85 | 0.12 | 5 | 138 | 12 | 14 | 12 | 14 |
| 236.56 | 236.74 | Sandy Creek (2) | 139 | 236.72 | 0.19 | 5 | 139 | 12 | 14 | 12 | 14 |
| 263.65 | 263.96 | James River | 161 | 263.89 | 0.31 | 5 | 161 | 20 | 18 | 20 | 18 |
| 263.96 | 264.02 | | | | 0.06 | 5 | 161 | 20 | 18 | 20 | 18 |
| 264.08 | 264.33 | | | | 0.25 | 5 | 161 | 20 | 18 | 20 | 18 |
| 276.37 | 276.77 | Llano River | 168 | 276.57 | 0.40 | 5 | 168 | 20 | 18 | 20 | 18 |
| 525.31 | 525.49 | Pecos River | 250 | 525.44 | 0.19 | 5 | 250 | 12 | 15 | 12 | 15 |
| 526.48 | 526.88 | Unk 251 | 251 | 526.68 | 0.40 | 5 | 250 | 12 | 15 | 12 | 15 |

Table 7E-4. Recreational Waters Hypersensitive Segments Along Longhorn Pipeline

| Begin Mile | End Mile | Stream Name | Stream Number | Stream Crossing Milepoint | Segment length | Segment Overland Flow Code | Segment Drains to Stream Number: | DW Sens | Rec Sens | DW Sens x Overland Flow | Rec Sens x Overland Flow |
|------------|----------|---------------------------|---------------|---------------------------|----------------|----------------------------|----------------------------------|---------|----------|-------------------------|--------------------------|
| 63.81 | 64.00 | Clear Creek ³ | 44 | 63.91 | 0.19 | 5 | 45 | 13 | 16 | 13 | 16 |
| 64.00 | 64.06 | Brazos River | 45 | 64.00 | 0.06 | 5 | 45 | 13 | 16 | 13 | 16 |
| 127.88 | 128.00 | Hunt Creek | 83 | 127.92 | 0.12 | 5 | 83 | 8 | 17 | 8 | 17 |
| 131.30 | 131.54 | Alum Creek | 86 | 131.46 | 0.25 | 5 | 86 | 11 | 14 | 11 | 14 |
| 134.40 | 134.53 | Colorado River | 89 | 134.44 | 0.12 | 5 | 89 | 13 | 22 | 13 | 22 |
| 134.53 | 134.59 | * | 90 | 134.51 | 0.06 | 5 | 90 | 9 | 18 | 9 | 18 |
| 163.48 | 163.67 | Marble Creek | 101 | 163.50 | 0.19 | 5 | 101 | 16 | 18 | 16 | 18 |
| 163.67 | 163.86 | * | 102 | 163.56 | 0.19 | 5 | 101 | 16 | 18 | 16 | 18 |
| 163.92 | 164.04 | Onion Creek | 103 | 163.98 | 0.12 | 5 | 103 | 20 | 22 | 20 | 22 |
| 168.39 | 168.89 | Boggy Creek 104, 105, 106 | 104 | 168.55 | 0.50 | 5 | 106 | 10 | 16 | 10 | 16 |
| 168.89 | 168.95 | Boggy Creek | 105 | 168.79 | 0.06 | 5 | 106 | 10 | 16 | 10 | 16 |
| 168.95 | 169.26 | Boggy Creek | 106 | 168.82 | 0.31 | 5 | 106 | 10 | 16 | 10 | 16 |
| 174.61 | 174.67 | Slaughter Creek | 107 | 174.65 | 0.06 | 5 | 107 | 14 | 16 | 14 | 16 |
| 179.51 | 179.89 | Long Branch | 108 | 179.63 | 0.37 | 5 | 108 | 16 | 18 | 16 | 18 |
| 180.88 | 181.01 | Barton Creek | 109 | 180.92 | 0.12 | 5 | 109 | 18 | 20 | 18 | 20 |
| 185.42 | 185.79 | Fitzhugh Creek | 110 | 185.76 | 0.37 | 5 | 110 | 18 | 14 | 18 | 14 |
| 190.26 | 190.39 | Unk 111 | 111 | 190.34 | 0.12 | 5 | 111 | 16 | 16 | 16 | 16 |
| 196.10 | 196.29 | Unk 113 | 113 | 196.15 | 0.19 | 5 | 113 | 17 | 17 | 17 | 17 |
| 198.16 | 198.28 | Unk 114 | 114 | 198.23 | 0.12 | 5 | 114 | 17 | 17 | 17 | 17 |
| 198.59 | 198.78 | Pedernales River | 115 | 198.73 | 0.19 | 5 | 115 | 22 | 22 | 22 | 22 |
| 198.78 | 198.84 | Unk 116 | 116 | 198.80 | 0.06 | 5 | 115 | 22 | 22 | 22 | 22 |
| 199.34 | 199.46 | Unk 117 | 117 | 199.37 | 0.12 | 5 | 117 | 17 | 17 | 17 | 17 |
| 201.88 | 202.13 | Unk 118 | 118 | 201.94 | 0.25 | 5 | 118 | 17 | 17 | 17 | 17 |
| 202.26 | 202.57 | Cottonwood Creek | 119 | 202.49 | 0.31 | 5 | 119 | 18 | 18 | 18 | 18 |
| 203.13 | 203.31 | Cottonwood Creek | 120 | 203.19 | 0.19 | 5 | 120 | 17 | 17 | 17 | 17 |
| 203.31 | 203.44 | Cottonwood Creek | 121 | 203.37 | 0.12 | 5 | 121 | 17 | 17 | 17 | 17 |
| 204.93 | 205.05 | Unk 122 | 122 | 205.02 | 0.12 | 5 | 122 | 17 | 17 | 17 | 17 |
| 205.98 | 206.05 | Harden Russell | 123 | 206.03 | 0.06 | 5 | 123 | 16 | 16 | 16 | 16 |
| 207.91 | 208.04 | Buffalo Creek | 124 | 207.98 | 0.12 | 5 | 124 | 17 | 17 | 17 | 17 |
| 209.84 | 209.96 | Hickory Creek | 125 | 209.91 | 0.12 | 5 | 125 | 16 | 16 | 16 | 16 |
| 211.45 | 211.64 | Spring Branch | 126 | 211.61 | 0.19 | 5 | 126 | 15 | 15 | 15 | 15 |
| 213.25 | 213.44 | White Oak Creek | 127 | 213.26 | 0.19 | 5 | 127 | 16 | 16 | 16 | 16 |
| 229.29 | 229.35 | Crabapple Creek | 135 | 229.33 | 0.06 | 5 | 135 | 20 | 16 | 20 | 16 |
| 233.08 | 233.32 | Unk 137 | 137 | 233.19 | 0.25 | 5 | 137 | 14 | 14 | 14 | 14 |
| 234.75 | 234.88 | Sandy Creek (1) | 138 | 234.85 | 0.12 | 5 | 138 | 12 | 14 | 12 | 14 |
| 236.56 | 236.74 | Sandy Creek (2) | 139 | 236.72 | 0.19 | 5 | 139 | 12 | 14 | 12 | 14 |
| 263.65 | 263.96 | James River | 161 | 263.89 | 0.31 | 5 | 161 | 20 | 18 | 20 | 18 |
| 276.37 | 276.77 | Llano River | 168 | 276.57 | 0.40 | 5 | 168 | 20 | 18 | 20 | 18 |
| 525.31 | 525.49 | Pecos River | 250 | 525.44 | 0.19 | 5 | 250 | 12 | 15 | 12 | 15 |
| 526.48 | 526.88 | Unk 251 | 251 | 526.68 | 0.40 | 5 | 250 | 12 | 15 | 12 | 15 |

Table 7E-5. Recreational or Drinking Water Sensitive Segments Along Longhorn Pipeline

| Begin Mile | End Mile | Stream Name | Stream Number | Stream Crossing Milepoint | Segment length | Segment Overland Flow Code | Segment Drains to Stream Number: | DW Sens | Rec Sens | DW Sens x Overland Flow | Rec Sens x Overland Flow |
|------------|----------|---------------------------|---------------|---------------------------|----------------|----------------------------|----------------------------------|---------|----------|-------------------------|--------------------------|
| 63.81 | 64.00 | Clear Creek ³ | 44 | 63.91 | 0.19 | 5 | 45 | 13 | 16 | 13 | 16 |
| 64.00 | 64.06 | Brazos River | 45 | 64.00 | 0.06 | 5 | 45 | 13 | 16 | 13 | 16 |
| 127.88 | 128.00 | Hunt Creek | 83 | 127.92 | 0.12 | 5 | 83 | 8 | 17 | 8 | 17 |
| 131.30 | 131.54 | Alum Creek | 86 | 131.46 | 0.25 | 5 | 86 | 11 | 14 | 11 | 14 |
| 134.40 | 134.53 | Colorado River | 89 | 134.44 | 0.12 | 5 | 89 | 13 | 22 | 13 | 22 |
| 134.53 | 134.59 | * | 90 | 134.51 | 0.06 | 5 | 90 | 9 | 18 | 9 | 18 |
| 163.48 | 163.67 | Marble Creek | 101 | 163.50 | 0.19 | 5 | 101 | 16 | 18 | 16 | 18 |
| 163.67 | 163.86 | * | 102 | 163.56 | 0.19 | 5 | 101 | 16 | 18 | 16 | 18 |
| 163.92 | 164.04 | Onion Creek | 103 | 163.98 | 0.12 | 5 | 103 | 20 | 22 | 20 | 22 |
| 164.10 | 164.17 | | | | 0.06 | 4 | 103 | 20 | 22 | 16 | 17.6 |
| 164.91 | 164.97 | | | | 0.06 | 4 | 103 | 20 | 22 | 16 | 17.6 |
| 167.34 | 167.52 | | | | 0.19 | 5 | 104 | 14 | 16 | 14 | 16 |
| 168.08 | 168.27 | | | | 0.19 | 5 | 104 | 14 | 16 | 14 | 16 |
| 168.39 | 168.89 | Boggy Creek 104, 105, 106 | 104 | 168.55 | 0.50 | 5 | 106 | 10 | 16 | 10 | 16 |
| 168.89 | 168.95 | Boggy Creek | 105 | 168.79 | 0.06 | 5 | 106 | 10 | 16 | 10 | 16 |
| 168.95 | 169.26 | Boggy Creek | 106 | 168.82 | 0.31 | 5 | 106 | 10 | 16 | 10 | 16 |
| 174.61 | 174.67 | Slaughter Creek | 107 | 174.65 | 0.06 | 5 | 107 | 14 | 16 | 14 | 16 |
| 174.67 | 174.73 | | | | 0.06 | 5 | 107 | 14 | 16 | 14 | 16 |
| 179.51 | 179.89 | Long Branch | 108 | 179.63 | 0.37 | 5 | 108 | 16 | 18 | 16 | 18 |
| 180.20 | 180.26 | | | | 0.06 | 5 | 108 | 16 | 18 | 16 | 18 |
| 180.82 | 180.88 | | | | 0.06 | 4 | 109 | 18 | 20 | 14.4 | 16 |
| 180.88 | 181.01 | Barton Creek | 109 | 180.92 | 0.12 | 5 | 109 | 18 | 20 | 18 | 20 |
| 181.94 | 182.12 | | | | 0.19 | 4 | 109 | 18 | 20 | 14.4 | 16 |
| 182.12 | 182.19 | | | | 0.06 | 5 | 109 | 18 | 20 | 18 | 20 |
| 182.19 | 182.25 | | | | 0.06 | 4 | 109 | 18 | 20 | 14.4 | 16 |
| 182.37 | 182.43 | | | | 0.06 | 4 | 109 | 18 | 20 | 14.4 | 16 |
| 182.43 | 182.50 | | | | 0.06 | 5 | 109 | 18 | 20 | 18 | 20 |
| 182.62 | 182.68 | | | | 0.06 | 4 | 109 | 18 | 20 | 14.4 | 16 |
| 185.42 | 185.79 | Fitzhugh Creek | 110 | 185.76 | 0.37 | 5 | 110 | 18 | 14 | 18 | 14 |
| 189.46 | 189.58 | | | | 0.12 | 5 | 111 | 16 | 16 | 16 | 16 |
| 190.08 | 190.20 | | | | 0.12 | 5 | 111 | 16 | 16 | 16 | 16 |
| 190.26 | 190.39 | Unk 111 | 111 | 190.34 | 0.12 | 5 | 111 | 16 | 16 | 16 | 16 |
| 191.38 | 191.44 | | | | 0.06 | 5 | 111 | 16 | 16 | 16 | 16 |
| 192.19 | 192.25 | | | | 0.06 | 4 | 112 | 19 | 19 | 15.2 | 15.2 |
| 192.63 | 192.94 | | | | 0.31 | 4 | 112 | 19 | 19 | 15.2 | 15.2 |
| 192.94 | 193.00 | | | | 0.06 | 5 | 112 | 19 | 19 | 19 | 19 |
| 193.25 | 193.31 | | | | 0.06 | 5 | 112 | 19 | 19 | 19 | 19 |
| 193.31 | 193.43 | | | | 0.12 | 4 | 112 | 19 | 19 | 15.2 | 15.2 |
| 193.68 | 194.18 | | | | 0.50 | 4 | 112 | 19 | 19 | 15.2 | 15.2 |
| 196.10 | 196.29 | Unk 113 | 113 | 196.15 | 0.19 | 5 | 113 | 17 | 17 | 17 | 17 |
| 197.29 | 197.53 | | | | 0.25 | 5 | 114 | 17 | 17 | 17 | 17 |
| 198.16 | 198.28 | Unk 114 | 114 | 198.23 | 0.12 | 5 | 114 | 17 | 17 | 17 | 17 |
| 198.59 | 198.78 | Pedernales River | 115 | 198.73 | 0.19 | 5 | 115 | 22 | 22 | 22 | 22 |
| 198.78 | 198.84 | Unk 116 | 116 | 198.80 | 0.06 | 5 | 115 | 22 | 22 | 22 | 22 |
| 198.84 | 198.96 | | | | 0.12 | 4 | 115 | 22 | 22 | 17.6 | 17.6 |
| 199.34 | 199.46 | Unk 117 | 117 | 199.37 | 0.12 | 5 | 117 | 17 | 17 | 17 | 17 |
| 201.26 | 201.39 | | | | 0.12 | 5 | 118 | 17 | 17 | 17 | 17 |
| 201.88 | 202.13 | Unk 118 | 118 | 201.94 | 0.25 | 5 | 118 | 17 | 17 | 17 | 17 |
| 202.26 | 202.57 | Cottonwood Creek | 119 | 202.49 | 0.31 | 5 | 119 | 18 | 18 | 18 | 18 |
| 202.57 | 202.63 | | | | 0.06 | 5 | 119 | 18 | 18 | 18 | 18 |
| 203.13 | 203.31 | Cottonwood Creek | 120 | 203.19 | 0.19 | 5 | 120 | 17 | 17 | 17 | 17 |
| 203.31 | 203.44 | Cottonwood Creek | 121 | 203.37 | 0.12 | 5 | 121 | 17 | 17 | 17 | 17 |
| 204.93 | 205.05 | Unk 122 | 122 | 205.02 | 0.12 | 5 | 122 | 17 | 17 | 17 | 17 |
| 205.05 | 205.18 | | | | 0.12 | 5 | 122 | 17 | 17 | 17 | 17 |
| 205.98 | 206.05 | Harden Russell | 123 | 206.03 | 0.06 | 5 | 123 | 16 | 16 | 16 | 16 |
| 206.23 | 206.36 | | | | 0.12 | 5 | 123 | 16 | 16 | 16 | 16 |
| 207.91 | 208.04 | Buffalo Creek | 124 | 207.98 | 0.12 | 5 | 124 | 17 | 17 | 17 | 17 |

Table 7E-5. (Continued)

| Begin Mile | End Mile | Stream Name | Stream Number | Stream Crossing Milepoint | Segment length | Segment Overland Flow Code | Segment Drains to Stream Number: | DW Sens | Rec Sens | DW Sens x Overland Flow | Rec Sens x Overland Flow |
|------------|----------|-----------------|---------------|---------------------------|----------------|----------------------------|----------------------------------|---------|----------|-------------------------|--------------------------|
| 209.22 | 209.34 | | | | 0.12 | 5 | 125 | 16 | 16 | 16 | 16 |
| 209.84 | 209.96 | Hickory Creek | 125 | 209.91 | 0.12 | 5 | 125 | 16 | 16 | 16 | 16 |
| 211.45 | 211.64 | Spring Branch | 126 | 211.61 | 0.19 | 5 | 126 | 15 | 15 | 15 | 15 |
| 212.82 | 212.88 | | | | 0.06 | 5 | 127 | 16 | 16 | 16 | 16 |
| 213.19 | 213.25 | | | | 0.06 | 5 | 127 | 16 | 16 | 16 | 16 |
| 213.25 | 213.44 | White Oak Creek | 127 | 213.26 | 0.19 | 5 | 127 | 16 | 16 | 16 | 16 |
| 229.29 | 229.35 | Crabapple Creek | 135 | 229.33 | 0.06 | 5 | 135 | 20 | 16 | 20 | 16 |
| 233.08 | 233.32 | Unk 137 | 137 | 233.19 | 0.25 | 5 | 137 | 14 | 14 | 14 | 14 |
| 234.75 | 234.88 | Sandy Creek (1) | 138 | 234.85 | 0.12 | 5 | 138 | 12 | 14 | 12 | 14 |
| 236.56 | 236.74 | Sandy Creek (2) | 139 | 236.72 | 0.19 | 5 | 139 | 12 | 14 | 12 | 14 |
| 263.65 | 263.96 | James River | 161 | 263.89 | 0.31 | 5 | 161 | 20 | 18 | 20 | 18 |
| 263.96 | 264.02 | | | | 0.06 | 5 | 161 | 20 | 18 | 20 | 18 |
| 264.08 | 264.33 | | | | 0.25 | 5 | 161 | 20 | 18 | 20 | 18 |
| 276.37 | 276.77 | Llano River | 168 | 276.57 | 0.40 | 5 | 168 | 20 | 18 | 20 | 18 |
| 525.31 | 525.49 | Pecos River | 250 | 525.44 | 0.19 | 5 | 250 | 12 | 15 | 12 | 15 |
| 526.48 | 526.88 | Unk 251 | 251 | 526.68 | 0.40 | 5 | 250 | 12 | 15 | 12 | 15 |

Figure 7E-1. Drinking Water Sensitivity

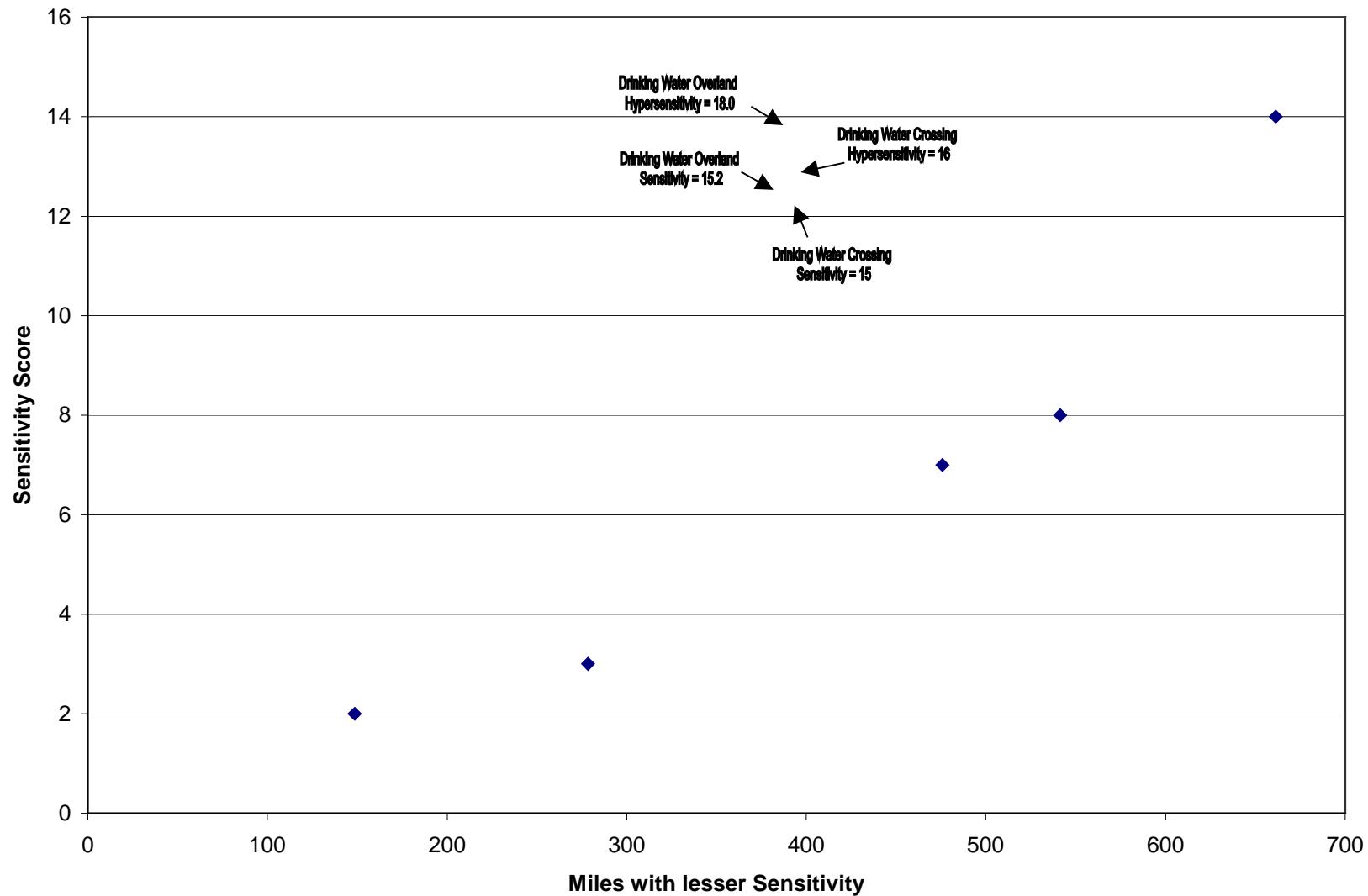


Figure 7E-2. Recreational Sensitivity

